

# NEBRASKA LINKING STUDY

A Study of the Alignment of the NWEA RIT Scale  
with Nebraska's State Accountability Assessment (NeSA)

November 2011

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# A STUDY OF THE ALIGNMENT OF THE NWEA RIT SCALE WITH THE NEBRASKA'S CRITERION-REFERENCED TEST (CRT) AND HIGH SCHOOL PROFICIENCY EXAM (HSPE)

NOVEMBER 2011

Recently, NWEA completed a project to connect the scale of Nebraska's State Accountability Assessment (NeSA) used for Nebraska's mathematics and reading assessments with NWEA's RIT scale. Information from the state assessments was used in a study to establish performance-level scores on the RIT scale that would indicate a good chance of success on these tests.

To perform the analysis, we linked together state test and NWEA test results for a sample of 7,081 Nebraska students from at least 14 districts who completed both exams in the spring of 2011. The Nebraska state test is administered in the spring; for the spring season (labeled "current season"), an Equipercntile method was used to estimate the RIT score equivalent to each state performance level. For fall (labeled "prior season"), we determined the percentage of the population within the selected study group that performed at each level on the state test and found the equivalent percentile ranges within the NWEA dataset to estimate the cut scores. For example, if 40% of the study group population in grade 3 mathematics performed below the proficient level on the state test, we would find the RIT score that would be equivalent to the 40<sup>th</sup> percentile for the study population (this would not be the same as the 40<sup>th</sup> percentile in the NWEA norms). This RIT score would be the estimated point on the NWEA RIT scale that would be equivalent to the minimum score for proficiency on the state test. Documentation about this method can be found on our website.

Table Sets 1 and 2 show the best estimate of the minimum RIT equivalent to each state performance level for same-season (spring) and prior-season (fall) RIT scores. These tables can be used to identify students who may need additional help to perform well on these tests.

Table Sets 3 and 4 show the estimated probability of a student receiving a proficient score on the state assessment, based on that student's RIT score. These tables can be used to assist in identifying students who are not likely to pass these assessments and also for identifying target RIT-score objectives likely to correspond to successful or "proficient" performance on the state test.

Table 5 shows the correlation coefficients between MAP and the state test in each grade. These statistics show the degree to which MAP and the state test are linearly related, with values at or near 1.0 suggesting a perfect linear relationship, and values near 0.0 indicating no linear relationship. Table 6 shows the percentages of students at each grade and within each subject whose status on the state test (i.e., whether or not the student "met standards") was accurately predicted by their MAP performance and using the estimated cut scores within the current study. This table can be used to understand the predictive validity of MAP with respect to the NeSA.

TABLE SET 1 – MINIMUM ESTIMATED SAME-SEASON (SPRING) RIT CUT SCORES  
CORRESPONDING TO STATE PERFORMANCE LEVELS

MATH-Current Season					
Cut Scores and Percentiles for each State Performance Level					
Grade	Below	Meets		Exceeds	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<188	188	42	203	82
3	<201	201	42	215	82
4	<209	209	40	227	85
5	<216	216	38	237	86
6	<225	225	47	241	83
7	<230	230	48	248	84
8	<235	235	51	254	86
11	<241	241	55	258	84

READING-Current Season					
Cut Scores and Percentiles for each State Performance Level					
Grade	Below	Meets		Exceeds	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<187	187	44	208	89
3	<197	197	44	217	89
4	<202	202	38	219	81
5	<209	209	40	225	81
6	<211	211	36	227	77
7	<213	213	32	230	76
8	<217	217	35	235	80
11	<224	224	51	239	81

\* Note: the cut scores shown in this table are the **minimum** estimated scores. Meeting the minimum MAP cut score corresponds to a 50% probability of achieving that performance level. Use the probabilities in Table Set 3 to determine the appropriate ‘target’ scores for a desired level of certainty. Italics represent extrapolated data.

TABLE SET 2 – MINIMUM ESTIMATED PRIOR-SEASON (FALL) RIT CUT SCORES  
CORRESPONDING TO STATE PERFORMANCE LEVELS

MATH-Prior Season					
Cut Scores and Percentiles for each State Performance Level					
Grade	Below	Meets		Exceeds	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<175	175	39	190	81
3	<189	189	40	203	81
4	<200	200	39	217	85
5	<208	208	37	228	85
6	<218	218	45	234	82
7	<224	224	46	242	84
8	<230	230	50	248	85
11	<238	238	54	256	85

READING-Prior Season					
Cut Scores and Percentiles for each State Performance Level					
Grade	Below	Meets		Exceeds	
	Cut Score	Cut Score	Perce- tile	Cut Score	Perce- tile
2	<173	173	42	195	89
3	<187	187	42	208	88
4	<195	195	37	212	80
5	<203	203	38	219	80
6	<207	207	35	223	77
7	<209	209	30	226	74
8	<213	213	33	232	80
11	<224	224	51	238	81

\* Note: the cut scores shown in this table are the **minimum** estimated scores. Meeting the minimum MAP cut score corresponds to a 50% probability of achieving that performance level. Use the probabilities in Table Set 4 to determine the appropriate ‘target’ scores for a desired level of certainty. Italics represent extrapolated data.

TABLE SET 3 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE TEST IN SAME SEASON (SPRING), BY STUDENT GRADE AND RIT SCORE RANGE ON MAP ASSESSMENT

MATH-Current Season								
Probability of Passing State Test Based on Observed I								
RIT Range	2	3	4	5	6	7	8	11
120	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
125	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
130	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
135	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
140	1 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
145	1 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
150	2 %	1 %	0 %	0 %	0 %	0 %	0 %	0 %
155	4 %	1 %	0 %	0 %	0 %	0 %	0 %	0 %
160	6 %	2 %	1 %	0 %	0 %	0 %	0 %	0 %
165	9 %	3 %	1 %	1 %	0 %	0 %	0 %	0 %
170	14 %	4 %	2 %	1 %	0 %	0 %	0 %	0 %
175	21 %	7 %	3 %	2 %	1 %	0 %	0 %	0 %
180	31 %	11 %	5 %	3 %	1 %	1 %	0 %	0 %
185	43 %	17 %	8 %	4 %	2 %	1 %	1 %	0 %
190	55 %	25 %	13 %	7 %	3 %	2 %	1 %	1 %
195	67 %	35 %	20 %	11 %	5 %	3 %	2 %	1 %
200	77 %	48 %	29 %	17 %	8 %	5 %	3 %	2 %
205	85 %	60 %	40 %	25 %	12 %	8 %	5 %	3 %
210	90 %	71 %	52 %	35 %	18 %	12 %	8 %	4 %
215	94 %	80 %	65 %	48 %	27 %	18 %	12 %	7 %
220	96 %	87 %	75 %	60 %	38 %	27 %	18 %	11 %
225	98 %	92 %	83 %	71 %	50 %	38 %	27 %	17 %
230	99 %	95 %	89 %	80 %	62 %	50 %	38 %	25 %
235	99 %	97 %	93 %	87 %	73 %	62 %	50 %	35 %
240	99 %	98 %	96 %	92 %	82 %	73 %	62 %	48 %
245	100 %	99 %	97 %	95 %	88 %	82 %	73 %	60 %
250	100 %	99 %	98 %	97 %	92 %	88 %	82 %	71 %
255	100 %	100 %	99 %	98 %	95 %	92 %	88 %	80 %
260	100 %	100 %	99 %	99 %	97 %	95 %	92 %	87 %
265	100 %	100 %	100 %	99 %	98 %	97 %	95 %	92 %
270	100 %	100 %	100 %	100 %	99 %	98 %	97 %	95 %
275	100 %	100 %	100 %	100 %	99 %	99 %	98 %	97 %
280	100 %	100 %	100 %	100 %	100 %	99 %	99 %	98 %
285	100 %	100 %	100 %	100 %	100 %	100 %	99 %	99 %
290	100 %	100 %	100 %	100 %	100 %	100 %	100 %	99 %
295	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
300	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

\*Note: This table provides the estimated probability of passing the state test based on a MAP test score taken during that same (spring) season. Example: if a fifth grade student scored 200 on a MAP test taken during the spring season, her/his estimated probability of passing the state test is 17%.

Italics represent extrapolated data.

**Note: RIT scores greater than 300 have a 100% probability.**

READING-Current Season								
Probability of Passing State Test Based on Observed I								
RIT Range	2	3	4	5	6	7	8	11
120	0%	0%	0%	0%	0%	0%	0%	0%
125	0%	0%	0%	0%	0%	0%	0%	0%
130	0%	0%	0%	0%	0%	0%	0%	0%
135	1%	0%	0%	0%	0%	0%	0%	0%
140	1%	0%	0%	0%	0%	0%	0%	0%
145	1%	1%	0%	0%	0%	0%	0%	0%
150	2%	1%	1%	0%	0%	0%	0%	0%
155	4%	1%	1%	0%	0%	0%	0%	0%
160	6%	2%	1%	1%	1%	0%	0%	0%
165	10%	4%	2%	1%	1%	1%	1%	0%
170	15%	6%	4%	2%	2%	1%	1%	0%
175	23%	10%	6%	3%	3%	2%	1%	1%
180	33%	15%	10%	5%	4%	4%	2%	1%
185	45%	23%	15%	8%	7%	6%	4%	2%
190	57%	33%	23%	13%	11%	9%	6%	3%
195	69%	45%	33%	20%	17%	14%	10%	5%
200	79%	57%	45%	29%	25%	21%	15%	8%
205	86%	69%	57%	40%	35%	31%	23%	13%
210	91%	79%	69%	52%	48%	43%	33%	20%
215	94%	86%	79%	65%	60%	55%	45%	29%
220	96%	91%	86%	75%	71%	67%	57%	40%
225	98%	94%	91%	83%	80%	77%	69%	52%
230	99%	96%	94%	89%	87%	85%	79%	65%
235	99%	98%	96%	93%	92%	90%	86%	75%
240	100%	99%	98%	96%	95%	94%	91%	83%
245	100%	99%	99%	97%	97%	96%	94%	89%
250	100%	100%	99%	98%	98%	98%	96%	93%
255	100%	100%	100%	99%	99%	99%	98%	96%
260	100%	100%	100%	99%	99%	99%	99%	97%
265	100%	100%	100%	100%	100%	99%	99%	98%
270	100%	100%	100%	100%	100%	100%	100%	99%
275	100%	100%	100%	100%	100%	100%	100%	99%
280	100%	100%	100%	100%	100%	100%	100%	100%
285	100%	100%	100%	100%	100%	100%	100%	100%
290	100%	100%	100%	100%	100%	100%	100%	100%
295	100%	100%	100%	100%	100%	100%	100%	100%
300	100%	100%	100%	100%	100%	100%	100%	100%

Note: This table provides the estimated probability of passing the state test based on a MAP test score taken during that same (spring) season. Example: if a fifth grade student scored 200 on a MAP test taken during the spring season, her/his estimated probability of passing the state test is 29%.

Italics represent extrapolated data.

**Note: RIT scores greater than 300 have a 100% probability.**

TABLE SET 4 –ESTIMATED PROBABILITY OF SCORING AS PROFICIENT OR HIGHER ON THE STATE TEST IN PRIOR SEASON (FALL), BY STUDENT GRADE AND RIT SCORE RANGE ON MAP

MATH-Prior Season								
Probability of Passing State Test Based on Observed I								
RIT Range	2	3	4	5	6	7	8	11
120	0%	0%	0%	0%	0%	0%	0%	0%
125	1%	0%	0%	0%	0%	0%	0%	0%
130	1%	0%	0%	0%	0%	0%	0%	0%
135	2%	0%	0%	0%	0%	0%	0%	0%
140	3%	1%	0%	0%	0%	0%	0%	0%
145	5%	1%	0%	0%	0%	0%	0%	0%
150	8%	2%	1%	0%	0%	0%	0%	0%
155	12%	3%	1%	0%	0%	0%	0%	0%
160	18%	5%	2%	1%	0%	0%	0%	0%
165	27%	8%	3%	1%	0%	0%	0%	0%
170	38%	13%	5%	2%	1%	0%	0%	0%
175	50%	20%	8%	4%	1%	1%	0%	0%
180	62%	29%	12%	6%	2%	1%	1%	0%
185	73%	40%	18%	9%	4%	2%	1%	0%
190	82%	52%	27%	14%	6%	3%	2%	1%
195	88%	65%	38%	21%	9%	5%	3%	1%
200	92%	75%	50%	31%	14%	8%	5%	2%
205	95%	83%	62%	43%	21%	13%	8%	4%
210	97%	89%	73%	55%	31%	20%	12%	6%
215	98%	93%	82%	67%	43%	29%	18%	9%
220	99%	96%	88%	77%	55%	40%	27%	14%
225	99%	97%	92%	85%	67%	52%	38%	21%
230	100%	98%	95%	90%	77%	65%	50%	31%
235	100%	99%	97%	94%	85%	75%	62%	43%
240	100%	99%	98%	96%	90%	83%	73%	55%
245	100%	100%	99%	98%	94%	89%	82%	67%
250	100%	100%	99%	99%	96%	93%	88%	77%
255	100%	100%	100%	99%	98%	96%	92%	85%
260	100%	100%	100%	99%	99%	97%	95%	90%
265	100%	100%	100%	100%	99%	98%	97%	94%
270	100%	100%	100%	100%	99%	99%	98%	96%
275	100%	100%	100%	100%	100%	99%	99%	98%
280	100%	100%	100%	100%	100%	100%	99%	99%
285	100%	100%	100%	100%	100%	100%	100%	99%
290	100%	100%	100%	100%	100%	100%	100%	99%
295	100%	100%	100%	100%	100%	100%	100%	100%
300	100%	100%	100%	100%	100%	100%	100%	100%

\* Note: This table provides the estimated probability of passing the state test based on a MAP test score taken during that prior (fall) season. Example: if a fifth grade student scored 200 on a MAP test taken during the fall season, her/his estimated probability of passing the state test is 31%.

Italics represent extrapolated data.

**Note: RIT scores greater than 300 have a 100% probability.**

READING-Prior Season								
Probability of Passing State Test Based on Observed I								
RIT Range	2	3	4	5	6	7	8	11
120	0%	0%	0%	0%	0%	0%	0%	0%
125	1%	0%	0%	0%	0%	0%	0%	0%
130	1%	0%	0%	0%	0%	0%	0%	0%
135	2%	1%	0%	0%	0%	0%	0%	0%
140	4%	1%	0%	0%	0%	0%	0%	0%
145	6%	1%	1%	0%	0%	0%	0%	0%
150	9%	2%	1%	0%	0%	0%	0%	0%
155	14%	4%	2%	1%	1%	0%	0%	0%
160	21%	6%	3%	1%	1%	1%	0%	0%
165	31%	10%	5%	2%	1%	1%	1%	0%
170	43%	15%	8%	4%	2%	2%	1%	0%
175	55%	23%	12%	6%	4%	3%	2%	1%
180	67%	33%	18%	9%	6%	5%	4%	1%
185	77%	45%	27%	14%	10%	8%	6%	2%
190	85%	57%	38%	21%	15%	13%	9%	3%
195	90%	69%	50%	31%	23%	20%	14%	5%
200	94%	79%	62%	43%	33%	29%	21%	8%
205	96%	86%	73%	55%	45%	40%	31%	13%
210	98%	91%	82%	67%	57%	52%	43%	20%
215	99%	94%	88%	77%	69%	65%	55%	29%
220	99%	96%	92%	85%	79%	75%	67%	40%
225	99%	98%	95%	90%	86%	83%	77%	52%
230	100%	99%	97%	94%	91%	89%	85%	65%
235	100%	99%	98%	96%	94%	93%	90%	75%
240	100%	100%	99%	98%	96%	96%	94%	83%
245	100%	100%	99%	99%	98%	97%	96%	89%
250	100%	100%	100%	99%	99%	98%	98%	93%
255	100%	100%	100%	99%	99%	99%	99%	96%
260	100%	100%	100%	100%	100%	99%	99%	97%
265	100%	100%	100%	100%	100%	100%	99%	98%
270	100%	100%	100%	100%	100%	100%	100%	99%
275	100%	100%	100%	100%	100%	100%	100%	99%
280	100%	100%	100%	100%	100%	100%	100%	100%
285	100%	100%	100%	100%	100%	100%	100%	100%
290	100%	100%	100%	100%	100%	100%	100%	100%
295	100%	100%	100%	100%	100%	100%	100%	100%
300	100%	100%	100%	100%	100%	100%	100%	100%

\* Note: This table provides the estimated probability of passing the state test based on a MAP test score taken during that prior (fall) season. Example: if a fifth grade student scored 200 on a MAP test taken during the fall season, her/his estimated probability of passing the state test is 43%.

Italics represent extrapolated data.

**Note: RIT scores greater than 300 have a 100% probability.**



TABLE 5 – CORRELATION COEFFICIENTS BETWEEN MAP AND STATE TEST FOR EACH GRADE AND TEST SUBJECT

Grade	Math Correlation Pearson's r	Reading Correlation Pearson's r
3	0.788	0.781
4	0.837	0.783
5	0.843	0.774
6	0.861	0.774
7	0.848	0.767
8	0.845	0.725
11	0.770	0.733

\* Note: Correlations range from 0 (indicating no correlation between the state test score and the NWEA test score) to 1 (indicating complete correlation between the state test score and the NWEA test score).

TABLE 6 – PERCENTAGE OF STUDENTS WHOSE PASS STATUS WAS ACCURATELY PREDICTED BY THEIR MAP PERFORMANCE USING REPORTED CUT SCORES

Grade	Sample Size	MAP Accurately Predicted State Performance	MAP Underestimated State Performance	MAP Overestimated State Performance
Mathematics				
3	1102	84.6%	8.1%	7.4%
4	1054	85.2%	7.8%	7.0%
5	1189	86.7%	6.1%	7.1%
6	1013	85.7%	7.0%	7.3%
7	979	86.0%	6.9%	7.0%
8	1010	85.7%	7.3%	6.9%
11	681	85.2%	6.9%	7.9%
Reading				
3	1098	81.6%	9.4%	9.0%
4	1057	83.4%	8.6%	7.9%
5	1194	84.0%	7.8%	8.2%
6	1013	84.8%	6.8%	8.4%
7	978	87.4%	6.4%	6.1%
8	941	85.4%	6.8%	7.8%
11	677	82.0%	9.0%	9.0%

\* Note: The third column of this table shows the percentage of students whose Pass/Not Pass status was predicted accurately when their state test score was linked to their MAP score based on this linking study. The fourth column shows the percentage of students whose MAP score predicted they would not pass the state benchmark but they did pass. The last column shows the percentage of students whose MAP score predicted they would pass the state benchmark but they did not pass. Due to rounding, percentages may not add to 100%.